

**AMENDMENTS TO THE DRAWINGS**

Replacement drawings for Figures 5, 11 and 14 in compliance with 37 C.F.R. 1.121(d) are included as an attachment hereto. The corrected drawings are labeled as Replacement Sheet. The corrections to the drawings simply include corrections to clarify what is originally disclosed in the drawings and specification.

No new matter has been added by the corrections to the drawings.

### **Remarks**

#### **Status of the Claims**

Claims 1, 2, 5, 7-10, 13-18, 20-37 and 40-45 are currently pending in the application. Claims 3, 4, 6, 11, 12, 38 and 39 are cancelled. Claim 19 is currently amended.

#### **Status of the Specification**

Applicants' counsel has taken this opportunity to review the specification and correct several typographical errors. Specifically, Applicants have amended paragraphs [0044], [0045], [0046] and [0052] to correct various informalities. No new matter is being submitted.

#### **Status of the Drawings**

As requested by the Examiner, replacement drawings in compliance with 37 C.F.R. 1.121(d) are included as an attachment hereto showing revised Fig 05, and Figs 11 and 14 which have been cross-hatched. Applicant respectfully points out that Figs 22 and 23 are plan views and not section views (see page 9 lines 1-3 of the application). Therefore, cross hatching would not be appropriate in these drawings, and no amendment of the drawings appears to be required in respect of Figs 22 and 23. The specification has been amended so that Figures 20 and 21 are now correctly identified as views from beneath, rather than section views. Reference number 9h has been deleted from the revised drawings. Reference number 9l has been added to the description at the third line of the second paragraph of page 10 of the PCT specification as published.

It is respectfully requested that the objection to the drawings be withdrawn.

***Claim rejections – 35 USC § 103***

Claims 1, 2, 7-10, 13-33, 35-37, and 40-45 stand rejected under 35 USC § 103(a) as being unpatentable over *Buttolph* in view of *DeBray*. The examiner acknowledges that the *Buttolph* reference fails to disclose the claimed feature of the sleeve being split along one side to clamp around the drill string. *DeBray* is cited as disclosing the feature of the split and being clamped in place. The examiner contends that:

*“...it would have been obvious to one of ordinary skill in the art to modify Buttolph such that the sleeve was split and clamped around the drill pipe, rather than threadedly attached in order to enable the sleeve to be connected to the drill pipe “at most any location along the string” (Debray et al Column 4 lines 26-28) rather than being constrained to the areas which had threads....”*

All of the independent claims rejected on this basis (1, 35, 36, 44, 45) share the same feature of the sleeve being split to clamp around the drill string.

In response to this argument and rejection applicant submits herewith a declaration under 37 CFR 1.132 made by Mr Paul Williams, an oil well drilling expert and a person skilled in the art of drilling operations, including directional drilling operations. *Buttolph's* stated objectives all relate to drilling operations, especially directional drilling operations. Mr Williams is therefore suitably qualified to provide an opinion as to whether a skilled person would be motivated to modify the *Buttolph* design in the way that the examiner suggests, to split the sleeve along one side to clamp it around the drill string.

As can be seen from the attached declaration of Mr Williams, the *Buttolph* device is a very simple and robust device, which was engineered for incredibly high stress, high shear

environments found at the bottom hole assembly. The forces that would have been acting on the *Buttolph* device are very large and the most important aspect of the *Buttolph* device is that it should be robust and should not become detached. *Buttolph* himself plainly states at column 2 lines 1-4 that his device is

*....simple and rugged so that there is no danger of it becoming fouled or its parts becoming detached in the course of operation.*

This last portion is significant for the consideration of obviousness, as one seeking to improve *Buttolph's* device would adhere to his specific teaching to avoid any parts of the device becoming detached during use.

Applicant respectfully directs the examiner to the comments concerning the *Buttolph* device in the attached declaration of drilling expert Mr Williams and his conclusion that one skilled in the art would NOT be motivated to modify the solid cylindrical design that is integrated into the drill string as taught by *Buttolph* as a result of the teaching of *DeBray*. Specifically, Mr Williams states that the *Buttolph* sleeve could not be modified to a clamp-on design with a split along one side of the sleeve to clamp it around the drill string, because this would decrease the structural integrity of the modified device and would make it more likely that the modified *Buttolph* device would fail at the connections, or that connecting bolts or other parts that were merely clamped on would become detached, which is exactly what Buttolph seeks to avoid as pointed out in the quoted passage above from column 2 lines 1-4. *Buttolph* is therefore a clear teaching away from the invention.

As Mr Williams explains, one of the main reasons for the *Buttolph* device being an integral device formed as part of the drill string rather than a clamp-on design is that it is common during drilling operations for the *Buttolph* device to become stuck in the hole and in such cases, the

remedy would be to try to free the device by subjecting it to very high axial forces applied by setting down weight from the surface so that the *Buttolph* sleeve was pressed down against the blockage, in order to cut itself free by means of the blades. This involves the substantial weight of the drill string being set down on the stuck *Buttolph* device. As taught by *Buttolph* at column 7 lines 15-28, it is an important aspect of the *Buttolph* design that the sleeve was able to be jarred in such circumstances.

The skilled person therefore evidently understands that the kinds of forces that the sleeve was able to withstand during such jarring operations would be completely incompatible with the possibility of splitting the sleeve and clamping it in place. It would not be possible to clamp it tightly enough to the string to withstand the enormous axial forces that would be applied to the clamped modified sleeve in such jarring operations. With the enormous axial forces applied to the string as a whole and focussed on the sleeve in particular, a modified clamp-on sleeve which would tend to slide up or down the string in such jarring operations. Alternatively, jarring the clamped sleeve would probably lead to damage to the clamp structure so that parts of the sleeve or the bolts or other fixings that retained it in place came loose and interfered with subsequent operations. If a stuck drill guide were to be damaged in this way during a jarring operation, this would be a very difficult position to recover from, because the damaged components that fell from the modified clamp-on guide could not be recovered from the hole without first removing the stuck string, at huge expense in operator and rig time.

Accordingly the skilled person would not modify *Buttolph* in any way that was likely to reduce the structural integrity of the device after the modification was carried out, and so it would not be obvious to modify the *Buttolph* device by the teachings of *DeBray* to make it a clamp-on instead of an integral device.

The other independent claims 35, 36, 44 and 45 rejected on this same basis all include the same clamping feature claimed in claim 1, which is completely contrary to the teachings of *Buttolph* as explained above, and therefore are also allowable for the same reasons. The dependent claims also rejected include the clamp feature by virtue of their dependence, and so are also allowable for the same reasons.

Accordingly, the rejection of the claims 1, 2, 7-10, 13-33, 35-37, and 40-45 under 35 USC § 103(a) on the basis of *Buttolph* in view of *DeBray* is respectfully traversed.

Claim 5 has been rejected under 35 USC § 103(a) over *Buttolph* in view of *DeBray* and *Yancey*

Claim 5 includes the recitations of independent claim 1 by its dependency therefrom. As discussed above, claim 1 is allowable over the combination of *Buttolph* and *DeBray*. Claim 5 is therefore allowable at least by virtue of its dependency. The skilled person who considered these references in addition to *Yancey* would also find that both the *Yancey* and *Buttolph* references advocate a solid annular (ring shaped) sleeve and hence would be led even further AWAY from considering a split sleeve as shown in the Fig 1 embodiment of the invention claimed, which has a sleeve structured to be opened to fit around a drill string and closed to clamp around it. Accordingly the embodiments of the invention as claimed in any of the present claims, including claim 1 and claim 5, are NOT obvious over the combined disclosures of *Buttolph*, *DeBray* and *Yancey*.

The examiner's rejection of claim 5 on this basis is thereby respectfully traversed.

Claim 34 has been rejected under 35 USC § 103(a) over *Buttolph* in view of *DeBray* and *Shizawa* (JP62101149). Claim 34 is dependent from claim 1.

As set out above, a skilled person would not be led to modify the *Buttolph* device by using a modification that involved splitting the sleeve and clamping it onto the string, rather than using a cylindrical sleeve and incorporating that into the string as the *Buttolph* reference teaches. Accordingly, the ordinarily skilled person would not consider the *DeBray* system to be at all useful as a source of potential modifications. As explained above, the ordinarily skilled person would therefore not be motivated to combine the teachings of *Buttolph* and *DeBray* and thereby arrive at the invention claimed in claim 1, and so would be equally not motivated to combine those two references with *Shizawa* to arrive at the invention claimed in claim 34. Claim 34 is therefore allowable at least by virtue of its dependency on allowable claim 1. In any event, *Shizawa* is not even concerned with wellbore apparatus, and does not consider any of the problems solved by the embodiments of the present invention. A skilled person would accordingly derive no motivation from *Shizawa* to adapt the *Buttolph* apparatus in any way.

The rejection of present claim 34 is therefore respectfully traversed.

It is respectfully submitted that the present application is now in condition for allowance, and such action is respectfully requested. Should the Examiner have any further issues regarding this application, the Examiner is requested to contact Applicant's attorney at the phone number below.

Application No 10/594,157  
Response to Final Office action mailed September 3, 2010

Respectfully submitted,

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Date: February 03, 2011

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